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# Phenotypic Characterisation of the Indigenous Zavot Cattle Under *In-situ* Conditions in Northeastern of Turkey

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**ABSTRACT**

The Zavot cattle were initially introduced to Northeastern Turkey by Molokon Community and Volga Germans that migrated from the interior of Russia and the Estonian border. This breed has mainly a genotype consisting of a cross between Simmental, Brown Swiss and Eastern Anatolian Red, but, it is also stated carrying the blood of the Podolia breed. Zavot cattle have light tones such as white and blondish for hair and coat color, and are generally horned. The mean for body weight, body length, height at withers and hearth girth at birth were 23.96 kg, 65.19 cm, 71.07 cm and 76.37 cm, respectively. The same values were 70.53 kg, 77.93 cm, 82.12 cm and 93.36 cm in 3 months of age, respectively. And, the values for same traits were also 385.9 kg, 145.7 cm, 126.3 cm, and 170.2 cm in adult age, respectively. The highest fat (4.22%), protein (3.37%) and dry matter ratio (12.42%) were found in August, June and August, respectively. Zavot cattle can show a high performance depending on the condition, although some existing phenotypic performance values are seen to lower, because of the unsuitable management conditions, and breeding area insufficiency.

# Türkiye'nin Kuzeydoğusunda *In-situ* Şartlar Altında Yerli Zavot Sığırının Fenotipik Karakterizasyonu

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**ÖZET**

Zavot sığırları ilk olarak Rusya'nın iç bölgelerinden ve Estonya sınırından göç eden Malakan Camiası ve Volga Almanları tarafından Türkiye'nin kuzeydoğusuna tanıtılmıştır. Bu ırk, temelde Simmental, İsviçre Esmeri ve Doğu Anadolu Kırmızısı'nın melezlemesinden oluşan genotipe sahip olsada, Podolya ırkı kanını da taşıdığı bildirilmiştir. Zavot sığırı kıl ve deri rengi bakımından beyaz ve sarımsı gibi açık tonlara sahiptir ve genellikle boynuzludur. Doğumda vücut ağırlığı, vücut uzunluğu, cidago yüksekliği ve göğüs çevresi değerleri sırasıyla 23,96 kg, 65,19 cm, 71,07 cm ve 76,37 cm' dir. Aynı değerler 3 aylık yaşta sırasıyla 70,53 kg, 77,93 cm, 82,12 cm ve 93,36 cm dir. Bu ölçüler ergin yaşta ise sırasıyla 385,9 kg, 145,7 cm, 126,3 cm ve 170,2 cm dır. Sütün en yüksek yağ (%4,22), protein (%3,37) ve kuru madde oranı (%12,42) sırasıyla Ağustos, Haziran ve Ağustos aylarında elde edilmiştir. Zavot sığırlarında, uygun olmayan sürü idare koşulları ve yetersiz yetiştiricilik uygulamalarından dolayı mevcut bazı fenotipik performans değerlerinin düşük olduğu görülse de, optimum şartlarda yüksek performans gösterebileceği düşünülmektedir.

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## Introduction

Indigenous animal breeds contribute a significant ratio to biodiversity and cultural variety that Turkey possesses, like being over the world. Breeders that have extensive conditions rely on these animals to ensure that their local resources deliver the advantages necessary for rational rearing (Yüksel, 2019). The indigenous animal breeds have important roles for basic dynamics, such as the development of new technologies, creation of models, the establishment of systematic animal production, agricultural diversification, and sustainable agricultural production. Recently, pandemics having seen in the world have started to bring agenda the importance of life in places far from crowded environments. Thus, even the smallest information about these animals is considered to be very important. One of these indigenous breeds is also Zavot Cattle. This breed that was reared in Turkey's eastern regions was obtained as a result of crossbreeding of exotic breeds with local breeds. In the early 18$^{th}$ century, Molokon Communutiy settled extensively across the Kars - Caucasian and Northeastern region of Turkey where they were well adapted in these environments and strived extensively by agriculture and livestock (Türkdoğan, 2005). Some families on the Estonian border, which is known as German families settled South-Caucasian region, because of their beliefs, in the early 1800's (Deveci Bozkuş, 2006; Anonim, 2008). Zavot breed cattle were mainly obtained as a result of the hybridization of Simmental and Brown Swiss bulls that were brought with them by Volga Germans and Molokon Communutiy who settled in the region with Eastern Anatolian Red cows (Üresin, 1936). It was also foreseen that this crossbreed genotype was mixed with the blood of the Podolya breeds (Üresin, 1936; Batu, 1955). Zavot cattle have as well proven to be good meat animals, especially under harsh climate conditions and in marginal areas in Eastern Regions of Turkey (İlaslan et al., 1998). Over the years, alteration of rearing style and intensive introduction of exotic breeds has substantially altered the genetic resource characteristics of this breed. In indigenous cattle, the lower of animal products such as meat and milk, compared to exotic breeds is among applications to different tendencies (Yüksel, 2019). However, the last point reached indicates that indigenous cattle breeds are indispensable. Because, they have lower feed consumption and higher disease resistance (Ertuğrul et al., 2000). In the context of these facts, it is of extreme importance to make a lot of studies about morphological and physiological characters of Zavot cattle, which can be aid salvation from bottlenecks in the future.

Therefore, the objective of this study is to investigate some physiological and morphological characteristics of Zavot cattle *in-situ* conservation conditions.

## Material and Methods

In this study, it was used the records of the Zavot herd that were initiated by the Ministry of Agriculture and Forestry - General Directorate of Agricultural Research and Policies in 2005 and continued for five year periods. The study was carried out in the local enterprises of the Ardahan province /Turkey, latitude 41º 07' N and longitude 42º 41' E. Mean annual rainfall and temperature recorded 555 mm and 3.6 ℃ the in the study area, respectively (Anonim, 2019). In the village management system in Ardahan

province, animals are tethered individually in closed barns in winter and are also grazed freely in the daytimes during the summer period in the pasture area. The winter feeding is mostly composed of dry meadow grass, alfalfa, oat grass, and wheat straws. Also concentrate feeds are given a little, particularly, during the winter season. Mating is occur with a few bulls grazing with the herd throughout April and May. The calving is seen intensively period February - March and the normal milking process, commonly, is started approximately 1 mo after calving.

The milk was fully breastfed to the calf during the first month period, the requirement of common practice. Then, the sample was collected to determine protein, fat, lactose, ash percentage and pH value. Each cow was milked separately to a milk tank. Milk samples were collected after homogenization of milk in 60-mL bottles with antimicrobial content. Samples were sent to the laboratory for milk quality analysis. All the analyses were performed using fully-automatic equipment (Mild Steel Lacto Plus Milk Analyser). The milk composition was determined by an infrared technique, according to ISO 9622 guidelines. The measurements of birth, 3 months of weaning, and adult age (36 + month) periods in the study, were measured using a measurement zone such as body length (BL), height at withers (HW), chest depth (CD), chest width (CW), and using a measuring tape zone such as heart girth (HG) and front shin girth (FSG). It was used a scale that was 10 g sensitive for determining birth weight. Body weights (BW) for 3 months of age and adult age were estimated by regression models developed to the breed the nearest based on some body measurements following as:

$BW = 137.6 – 2.647 \times HG + 0.024 \times HG^2$ (Willeke and Dürsch, 2002) (A)

$BW = -1068 + 2.80BL + 1.76WH + 5.02HG$ (Ozkaya and Bozkurt, 2009) (B)

$BW = a + bHG$ (Ulutaş et al.,2002)

where a = constant, b = linear coefficient for HG

In the research, the data were being collected qualitatively, and they were analyzed quantitatively, using percentages and means, to determine the breed. Therefore, it was used descriptive statistics for body weights and body measurements of animals at birth, 3 months of age and adult age. It was evaluated by this analysis the data procured from this study for BW, BL, HW, CD, CW, HG, and FSG (SPSS, 2001). The milk samples for components were taken from a total of 32 same animals that were milked also in the three months included in the assessment. Data for milk components were examined using Variance Analysis in General Linear Model. Duncan multiple comparison tests was also used to determine the differences between group means.

**Result and Discussion**

In this study based on physical analysis and observation in enterprises was reported course of some morphological characters of the breed (Table 1). These definitions are now recognized to be determinant characteristics of the breed and for animal selection is used for different purposes. The findings of the research indicated that was to be straight without crimps for coat pattern, light tone weighted for coat color, white tones for hair color, moderate coarse for hair characteristics, forehead wide and plain for

head structure, upward directional for horn shape and medium-saturity breast lobe for breast structure but there was a range of variation in the observation.

**Table 1.** Morphological traits of the Zavot cattle

| N | Morphology | Traits |
|---|---|---|
| | Coat pattern and characteristics | Straight without crimps, medium hardness when touched by hand, have a uniform structure |
| | Coat color | Light ton weighted, more pronounced lightness on the neck area, slightly darker on the out surfaces of the back legs |
| | Hair color | White hairs on all body, hairs in the same color tone from the coated surface to the tip, slight yellow hairs on the neck region<br>more pronounced yellowness in male, apparent dark tone hairs on tail tip |
| | Hair characteristics | Moderate coarse when touch by hand and bright, thin hairs relatively around the breast and neck region |
| | Head structure | Forehead wide and plain, nose region round, hair growth between the horns, more intense in male especially, dark on mouth region usually, eyelashes black |
| | Back structure | A straight line from neck to waist, a narrow-angle relatively between the waist and the coccyx, prominent pelvis |
| | Horn shape | Upward directional, also forward partially, spring style curvy, in a dark color, in a strict texture, a little short stubby pattern rarely |
| | Breast structure | Medium-saturity breast lobe, straight settled nipples, in an upright position to floor, in a volume suitable for machine milking |

Desriptive statistics for body weights and body measurements of calfs at birth were given in Table 2. The CV values indicated that variation for BL, HW, HG, waist height (WH) and front shin girth were 10% lower than BW, CD and CW.

There are increasing trends regarding consultation of Zavot cattle such as other cattle breeds to values of some body measurement, including HG generally and BL and HW specifically. Thus, body weight was estimated and was described to be numerical the physical characteristics of the breed.

**Table 2.** Descriptive statistics for body weights and body measurements of calves at birth.

| Traits | N | $\bar{x} \pm S_{\bar{x}}$ | Min | Max | CV (%) |
|---|---|---|---|---|---|
| Body Weight (kg) | 88 | 23.96 ± 0.43 | 18 | 32 | 17.0 |
| Body length (cm) | 62 | 65.19 ± 0.73 | 53 | 83 | 8.8 |
| Height at withers (cm) | 62 | 71.07 ± 0.53 | 66 | 85 | 5.8 |
| Chest depth (cm) | 62 | 30.61 ± 0.62 | 24 | 57 | 16.1 |
| Chest width (cm) | 62 | 16.53 ± 0.33 | 12 | 23 | 15.8 |
| Hearth girth (cm) | 62 | 76.37 ± 0.67 | 68 | 92 | 6.7 |
| Waist height (cm) | 62 | 75.87 ± .63 | 68 | 91 | 6.5 |
| Front shin girth (cm) | 62 | 10.65 ± 0.11 | 9 | 14 | 8.2 |

CV: coefficient of variation, Min: minimum, Max: maximum.

The measurements of BL, HG, HW from project animals and BW based on these values were presented in Table 3 and Table 4 for 3 months of age (weaning) and adult age respectively. The descriptive statistics results of 3 mo age showed that the CV value was 23.9 for the body weight prediction (Table 3).

**Table 3.** Descriptive statistics for body weights and body measurements of calves at 3 months of age (weaning).

| Traits | | N | $\bar{x} \pm S_{\bar{x}}$ | Min | Max | CV (%) |
|---|---|---|---|---|---|---|
| Body Weight (kg) | C | 88 | 70.53 ± 1.79 | 39 | 113 | 23.9 |
| Body length (cm) | | 88 | 77.93 ± 0.82 | 64 | 95 | 9.9 |
| Height at withers (cm) | | 88 | 82.12 ± 0.64 | 71 | 101 | 7.3 |
| Chest depth (cm) | | 88 | 34.95 ± 0.44 | 26 | 43 | 11.8 |
| Chest width (cm) | | 88 | 17.61 ± 0.32 | 12 | 25 | 17.4 |
| Hearth girth (cm) | | 88 | 93.36 ± 0.79 | 77 | 112 | 8.0 |
| Waist height (cm) | | 88 | 88.21 ± 0.62 | 79 | 106 | 6.6 |
| Front shin girth (cm) | | 88 | 11.28 ± 0.09 | 9 | 14 | 7.8 |

C (regression model) = a+bHG,
Min: minimum, Max: maximum, CV: coefficient of variation.

The CV values for birth weight of adult animals were predicted with A and B models were 16.6 and 18.7%, respectively. In these animals, CV for BL, HG, HW were 5.7, 6.9 and 4.0 respectively, and the variation of HW was lowest in the total herd (Table 4). Means for form milk components estimated from milk samples taken from the herd were reported in Table 5. August results, compared with June and November, were characterized by higher fat and dry matter ratio; significant ($P < 0.01$) differences were noted for these components. This state was in favor of June for protein, lactose and ash.

**Table 4.** Descriptive statistics for body weights and body measurements for Zavot cattle at adult age.

| Traits | | N | $\bar{x} \pm S_{\bar{x}}$ | Min | Max | CV (%) |
|---|---|---|---|---|---|---|
| Body Weight (kg) | A | 46 | 395.5 ± 7.7 | 252 | 568 | 16.6 |
| | B | 46 | 423.5 ± 9.3 | 276 | 584 | 18.7 |
| Body Length (cm) | | 46 | 145.7 ± 1.2 | 123 | 163 | 5.7 |
| Heart Girth (cm) | | 46 | 170.2 ± 1.7 | 137 | 200 | 6.9 |
| Height at Withers (cm) | | 46 | 126.3 ± 0.7 | 116 | 138 | 4.0 |

A (regression model): $137.6 - 2.647 \times HG + 0.024 \times HG^2$,
B (regression model): $-1068 + 2.80BL + 1.76WH + 5.02HG$,
Min: minimum, Max: maximum, CV: coefficient of variation.

In Zavot cattle coat pattern, coat color and hair color are very impressive character and particularly interesting in purchase and sale, because it is one of the ways considered in the yield direction preference that is produced meat and milk among breeders. In the origin of this breed, there are explicit roles of the Simmental on the one hand and Brown Swiss, and Eastern Anatolian Red on the other (Batu, 1955; Alpan, 1994).

**Table 5.** Least squares mean for various milk components of test day milk samples from Zavot cows.

| **Traits** | June (N = 32) $\bar{x} \pm S_{\bar{x}}$ | August ( N = 32) $\bar{x} \pm S_{\bar{x}}$ | November (N = 32) $\bar{x} \pm S_{\bar{x}}$ | **Sig** |
|---|---|---|---|---|
| Fat (%) | $3.15^{b} \pm 0.11$ | $4.22^{a} \pm 0.88$ | $3.52^{b} \pm 0.14$ | ** |
| Protein (%) | $3.37^{a} \pm 0.02$ | $3.16^{b} \pm 0.03$ | $3.10^{b} \pm 0.03$ | ** |
| Lactose (%) | $4.80^{a} \pm 0.06$ | $4.31^{b} \pm 0.06$ | $4.27^{b} \pm 0.05$ | ** |
| Ash (%) | $0.83^{a} \pm 0.00$ | $0.74^{b} \pm 0.01$ | $0.74^{b} \pm 0.00$ | ** |
| Dry Matter (%) | $12.00^{b} \pm 0.03$ | $12.42^{a} \pm 0.69$ | $12.04^{b} \pm 0.09$ | ** |
| pH | $6.06^{b} \pm 0.02$ | $6.42^{a} \pm 0.02$ | $6.43^{a} \pm 0.02$ | ** |

a-b: values shown with different letters on the same row are different statisticaly, **: P< 0.01, sig: significant.

Although Zavot cattle display an extensive coat color variation, breeders have focused on tones consisting of white in female, light blondish in males that contributes to meat and milk yield, evaluate rural conditions and local feed resources. Coat color was reported as an efficient character by Anzures-Olveraa et al., (2019) for body condition score, rectal temperature, hematologic change, fat-corrected milk and 305-d milk yield. Fertility and pregnancy are also an integral part of the livestock and as such must consider that their' effects they make may influence the sustainability of the enterprise. As it has been reported that there is a low correlation between coat color and fertility (Bertipaglia et al., 2005), the breeder's choice could broaden in terms of moving towards specific goals. The preference in white and blondish tones based on use style could be a result of the experience of long years of breeding under the same environmental conditions. It was reported light-colored and thin-coat characteristics of cattle

produced more milk with higher values of milk fat, protein, dry matter (Prabhakar et al., 2018). Scientific genetic researches that have made on the relationship between coat color and genetic variation in different livestock (Fontanesi et al., 2010; Fontanesi et al., 2011; Cavalcanti et al., 2017) in recent years shed more light on these issues. It can seem like a paradox in normally that proportion of horned animals are increasing in enterprises making extensive rearing. Zavot cattle breeders not only consider coat color but take care of also horn and horn shape which are used as showing off. The upsurge in relevance with the use of horned animals could be a source of the increased price if the animal is properly exhibited. On the other hand breeders of Zavot cattle have implemented strategies also to breast structure as in horn shape and coat color of animals. It was reported that relationships between nipple shape and breast lobe size may be determinant in milk yield (Tilki et al., 2005; Gracner et al., 2015). Zavot breeders prioritize their socio-economic conditions as well as the number of animals in their enterprises, which could be interpreted consist of indicating that there are certain commonalities among market price balances, animal yield performance, labor, etc.

Uncontrolled increases in body measurements of Zavot calves for birth can cause several adverse consequences, including be short commercial life of the animal, increase in calf mortality, potential dangers for animal health, and sustainable not breeding of the breed in line with standards. Yet, breeders desire still calves to have high birth weight and large body measurements. Unfortunately, it wasn't accounted for, generally, all requirements of calves such as giving enough milk, concentrate and space allocation to complete their development by breeders. The findings for Zavot calves' birth period were similar to studies made with some indigenous breeds or not. Nearly the same values for birth weights were reported in Southern Anatolian Red cattle (Hizli et al., 2018). On the other hand, higher results belonging to Zavot cattle confirmed that there are low birth weight breeds, which included Anatolian Black Cattle (Sakar and Zülkadir, 2018) and Eastern Anatolian Red cattle (Akbulut and Ulutas, 1994; Ulutaş et al., 2002), respectively. Hossain et al., (2017) reported, as different from the results of this study, the value of the birth weight for Zebu cattle under hot and humid temperatures in the Mymensingh district as lowly. Ali et al., (2018) evaluated the exclusive characteristics of breeds of Bhag Nari cattle prevailing in different parts of Pakistan and observed to be 21.74 ± 3.70 kg the birth weight. It was reported birth weights for Friesian x indigenous, Sahiwal x indigenous, Sindhi x indigenous and pure indigenous as 22.52 ± 0.32, 22.19 ± 0.35, 20.16 ± 0.86, and 17.0 ± 0.36 respectively by Rokonuzzaman et al., (2009). Body condition score and body weight are vital in 3 months of age for growth and development, especially for indigenous animals in extensive breeding. For breeders to benefit lifetime from these animal, feeding style must realize the context within which this age is necessitate.

BW is an important breed character. This character was also calculated based on different regression models as with actual measurements depending on some purposes. The use of a regression model for 3 mo old and adult animals in the present study facilitated the estimation of body weights along with the studies in the area. In some researches were studied the effectiveness of some regression models (Ulutaş et al., 2002; Willeke and Dürsch**,** 2002) to estimate with mathematical equations the body weight of

different ages of cattle. These mathematical models had been comparatively applied to the analysis of values for chest girth. The body weight estimate based on the regression model was mostly seen similar for 3 month age weight in models A and B, as desired, and some parameters such as the CV had close ratios in between models. Regression models had useful to explain body weights was estimating, indicating that there must be alternative models determining results in estimating body weight in tough area conditions. Despite some real determination and detection styles (Mwambene et al., 2014; Hossain et al., 2017; Sakar et al., 2020) in body weight determined for adult cattle, mathematical equality-based estimates still have preserved its actuality. Estimate models for Girolando cattle in Brasil by Weber et al., (2020), Zebu and their crosses with Guzerat or Bos Taurus in Senegal by Tebug et al., (2018), Fleckvieh (Simmental crossbred) heifers in Germany by Willeke and Dürsch (2002), Lagune cattle in Southern Benin by Comlan et al., (2017), crossbred beef cattle in Turkey by Ozkaya and Bozkurt (2009) and Holstein-Friesian cattle in Tayland by Mekparyup et al., (2013) was confirmed the body weight estimate models for adult cattle using in the present study. This character was calculated based on different regression models in crossbred cows in Turkey by Ozkaya and Bozkurt (2009), Girolando cattle in Brasil by Weber et al., (2020), indigenous Baggara bulls in Sudan by Abdelhadi and Babiker (2009), Zebu cattle in Senegal by Tebug et al., (2018) as 460, 473, 266 and 302 kg respectively.

The body measurements for animal 3 month of age has generally declared the role of the genetic structure underlying herd establish. Likewise, the phenotypic variance was assumed to be a good factor of herd establishment, and phenotypic selection to opportunity the provides by the genetic potential (San-Jose and Roulin, 2017). It was reported very useful to achieve a better understanding of breed characteristics in Anatolian Black cattle through the role of certain morphological traits, like weaning age body measurements in enterprises by Sakar et al., (2020). Similar notices were reported for Eastern Anatolian Red cattle by Ulutaş et al., (2002). In the present study, CV ratios were evident in inspected morphologic characters, with body length, heart girth, and height at withers having significantly lower values than the live weight. Present results among some body measurements were confirmed by Soro et al., (2015); Heryani et al., (2016); Said et al., (2017); Putra et al., (2020) who analyzed the data of body length, heart girth, and height at withers for Indonesian Bos indicus cattle breeds, Pasundan cattle at West Java, Baoule cattle in the Pays Lobi of Cote d'Ivoire, Taro White Cattle in Bali, respectively. The result of body length determined in the present study was higher than the results for White Fulani, Sokoto Gudali, Red Bororo, Bornu Kuri, Muturu indigenous breeds as 116.45, 116.03, 111.17, 112.64, 73.55 cm respectively from Nigeria (Oladepo et al., 2018) for Taro White Cattle, 96.58 cm from Bali (Heryani et al., 2016), for Kamrup, Sonitpur, NC Hills cattle, 83.6, 84.7, 82.5 cm respectively, from Assam in India (Kayastha et al., 2011), for Indigenous cattle in West Gojjam Administrative Zones, 115.41cm, from Ethiopia (Tenagne et al., 2016) and for Achai cows in sedentary farming system and transhumant farming system 112.2, 116.1 cm respectively, from Pakistan (Saleem et al., 2013). The body measurements were also found to similar results to body length results for heart girth and height at withers in carried out studies. It was reported that wither height and heart girth, 130.3, 83.2 cm

respectively for White Fulani cattle (Oladepo et al., 2018), 111.96, 121.17 cm respectively, for Taro White Cattle in Bali (Heryani et al., 2016), 91.9, 113.1 cm respectively for indigenous cattle of Assam (Kayastha et al., 2011), 114. 5, 146 cm respectively, for indigenous cattle populations in West Gojjam Administrative Zones in Ethiopia (Tenagne et al., 2016) by the researchers. Mwambene et al., (2014) selected based on some body measurements for improving dairy production in the Southern Highlands and Eastern Tanzania, and the values were reported height at withers, body length and heart girth 93, 97.6, 146 cm respectively.

One of the most important characters for Zavot breed is the component of milk contributing to provide sustainability of all traits affecting genetic resource and yield. Thus, from Zavot' milk had been produced a quality kashar and gruyere cheese in the previous period, but also, was exported to other countries that depend on production amount, primarily Czarist Russia (Üresin, 1936; Batu, 1955). Milk contents were determined that reared in Bloemfontein region of South Africa for Boran, Nguni, Tuli, Afrikaner, Bonsmara and Drakensberger cattle breeds protein, fat and dry matter ratio, 3.61, 2.68, 8.34; 2.96, 4.18, 9.44; 3.02, 2.01, 9.74; 3.16, 3.79, 8.95; 3.20, 3.76, 9.6 and 3.26, 3.63, 9.14, respectively by Myburgh et al., (2012). In a comparison of the fat ratio of this study with the Afrikaner, Bonsmara and Drakensberger breeds showed similarity, but also for protein ratio with all breeds. Kebede, (2018) analyzed milk from Eastern Ethiopia cattle breeds such as Ogaden and reported highly significant differences from this research results. This study, compared to study based on milk content on Norwegian Red X Frisian, Norwegian Red X Guernsey, and Norwegian Red X Jersey; Holstein X Norwegian Red and Norwegian Red X Holstein; Norwegian Red X Zebu and Norwegian Red X N'Dama and Zebu X GIR, Zebu X Norwegian Red, and Zebu X Holstein by Cheruiyot et al., (2018) was indicated high similarity. On the other hand, results similar to those obtained in this study were reported by Hirwa et al., (2017) except for fat content whose ratio was lower (2.80 %) in Inyambo-Friesian. As a result, it was concluded that, genetic potential and environmental factors might be efficients in productive and body measurements performance.

**Conclusion**

There is a need to intensify the conservation efforts, to identify breed characters, and to raise awareness in the public for Zavot one of the indigenous cattle reared in the Northeastern Anatolian Region. The Zavot cattle, which were heavily crossed with some exotic breeds, were nearly extinct. Morphometric traits are credible factors in differentiating cattle based on descriptive traits of the breed, the results obtained in this study can guide in proper identification of Zavot cattle breeds. The most dominant coat color in Zavot cattle was light tone weighted and frequently observed coat color type being white, blondish and they' tones. The majority of the animals have horns. Chest girth was one of the most important linear body measurement factors to estimate body weight. It has been determined that there are some differences between the results of other studies and this study in terms of body measurements and body weights.

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**Conflict of Interest**

The authors declared that there is no conflict of interest.

**Author's Contributions**

The first author took part in all stages of study. Other authors have contributed in the necessary areas.

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